Preserving species

Mark Williamson

Nature Reserves: Island Theory and Conservation Practice. By Craig L. Shafer. *Smithsonian Institution Press: 1991. Pp.183. Hbk $39.95, £31.25; pbk $15.95, £12.50.*

CONSERVATION can be a depressing subject. The steady increase both of the human population and of economic activity leads to the loss of habitats and so to the loss of species. The most obvious defence is to create reserves. Many questions arise: how many; where; what size and shape; should there be buffer zones; can there be corridors for wildlife connecting reserves?

These questions are addressed in this book, as is the larger question: does ecological theory help to find better answers? All reserves are, to some extent, comparable to islands, so it is not surprising that 'island theory', more accurately the MacArthur–Wilson theory, has been much discussed, and here quite critically.

Pictures and diagrams are included that bring home the immensity of the problem. Along with familiar maps of the reduction in the past few centuries of forest in Wisconsin, United States, and São Paulo, Brazil, and of heathland in Dorset, England, there are satellite photographs of parts of the contiguous United States showing how small many reserves are as a proportion both of the landscape and of the original ecosystem they represent. These photographs also show how these reserves are bound in by urban, agricultural and forest-extraction developments. The fragmentation, isolation and small size of the residua, the reserves, are all too evident.

The intention of this nicely produced book is given by some quotations: "a discussion of the theoretical aspects of nature reserve size, isolation, and design, as well as planning and management implications", "It is no longer wise for planners and managers simply to rely on any one scientist's translation of this literature into conservation guidance", "I have tried to include conflicting interpretations on as many points as possible" and "brought in aspects of the real world of nature reserve management, mostly ignored up to now in such papers".

This attempt to see all sides of the question in less than 200 pages is remarkably successful. There is a lot of 'A says this but B says that'. There are irritations like a 1966 date for a dataset that is only statistically reliable from 1969; the claim that H. C. Watson's important 1835 book (*Geographical Distribution of British Plants*, Longman) was not published, and an index that, for authors, refers only to the frequently quoted ones. More seriously, although there is much on extinction there is very little on invasion or immigration. The fashionable, if largely misleading, topic of 'metapopulation' is not mentioned, though it is based on a concept of an archipelago of populations. Along the way, there is much useful discussion of species–area relationships, minimum population size, the rate of species loss, as well as of the design of reserves, all of which should be known to managers and administrators. The difficulty that such people will have is that, although the broad concepts and guidelines are clear, rather few detailed decisions can follow directly from them.

The final conclusions are somewhat bland, but this is a proper reflection of the many and deep disagreements about the validity and bearing of much of the theory. Here are six from a list of 26: "The more land you set aside, the more species you will preserve"; "Habitat fragmentation and nature reserve insularization should be discouraged"; "Small populations should be avoided"; "To maintain biological diversity, laissez-faire management of nature reserves should be the exception, not the rule"; and, "Regional planning of nature reserves must take human population growth into account and consider the social and economic conditions on adjacent lands."

In that last conclusion are the major difficulties. How do you raise the money to set aside land for reserves and manage them properly? How do you get planners and executives to take decisions that assume the reserves preserve what they are meant to? In Britain, the questions have not usually been on the design of reserves; they have been on acquiring land, or making agreements on land, or on preventing development. The political, economic and social aspects of these difficulties are not dealt with. They vary much from country to country, but in the end they will determine which species survive.

At the moment, we can see no prospect of the end of population growth and changes in land use. Shafer boldly treats, from a palaeo-biological perspective, the problem of evolutionary arrest. If planning and acquisition have a timescale of ten years, and management of 100, evolution mostly comes in at a scale of 10,000 years upwards. In the scales in between come the problems caused by climatic and other environmental change, and they are not mentioned at all.

On the whole, this is a useful work of reference. Those who most appreciate the uncertainties of science will be best placed to argue convincingly in the public arena. □

Mark Williamson is in the Department of Biology, University of York, York YO1 5DD, UK.

■ Of related interest is *The Scientific Management of Temperate Communities for Conservation*, edited by I. F. Spellerberg, F. B. Goldsmith and M. G. Morris. Published by Blackwell at £45 (Hbk); £26.50 (Pbk). □

Inside story

John Gittus

The Truth About Chernobyl. By Grigori Medvedev. *Tauris/Basic Books: 1991. Pp.252. £14.95, $22.95.*

THIS year marks the fifth anniversary of the nuclear accident at Chernobyl and there has been a great deal of publicity for the plight of those still living on land contaminated by radioactive material that escaped from the reactor. Medvedev was chief engineer when the Chernobyl reactor was under construction, and was critical of the design at that time. Indeed, a number of serious criticisms had been published in Russian journals before the accident, showing the depth of concern felt by engineers living in a society that in those days was anything but open (*Glasnost* stemmed from the Chernobyl epoch).

Medvedev's technical account of the things that happened during the accident accords generally with our understanding, but his book certainly grips the reader's attention, bringing to life the people involved in a way that no dry, technical account could ever do. Most readers will find it difficult to follow the details of how the accident occurred from the account given in the book, but this does not detract from the tension that the author generates as he skilfully pieces together the sorry catalogue of events that led to prompt criticality and meltdown.

Our understanding had been that the contributing faults in the design of the reactor were its positive reactivity coefficients, which meant that it could not safely be left to 'simmer' without running the risk of boiling dry — exactly what happened in the accident — and 'positive scram'. Medvedev confirms this, pointing out that positive scram, the rise in reactivity that occurred when the operators tried to reduce reactivity by scramming (or switching off) the reactor, was not implicated by the Soviets until some time after the accident. A cover-up or just ignorance? Of particular interest to me is the graphic account given of the brainstorming session that led to the decision to use helicopters to drop thousands of tons of sand on the open, burning reactor, because this was something that I suggested in a number of radio and television interviews just after news of the accident reached us in Britain.

Chernobyl was just about the worst nuclear-power accident imaginable, and this book is a telling account of how it occurred and of its immediate consequences. The account of exactly how the accident was triggered, when deciphered, does not add to what we know already, but a dramatic human dimension is given by the verbatim testimony of operators, emergency workers, inhabitants of the neighbouring town, party officials and senior people who descended from Moscow. □

John Gittus is at the British Nuclear Forum, 22 Buckingham Gate, London SE1E 6LB, UK.